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# AN HISTORICAL PROFILE OF HAMILTON AND ITS HARBOUR

by

MARK SPROULE-JONES
COPPS PROFESSOR
McMASTER UNIVERSITY *

Copps Chair in Urban Studies

Department of Political Science
McMaster University
1280 Main Street West
Hamilton, Ontario
L8S 4M4

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Executive Summary

(1) This is the third Occasional Report from the Copps Chair at McMaster University, and the second concerned with Hamilton Harbour.

(2) The report presents a description of the physical and biological structures of the Harbour and of the socio-economic structure of the Harbour and its watershed.

(3) The information is presented in an historical fashion in order to indicate how far present conditions of the Harbour, its watershed and pressure on its uses, are the product of previous times and contingencies.

(4) The conclusions of this report emphasize how the Harbour and watershed have been modified and changed, well beyond what is to be expected on natural grounds, and how the socio-economic structure of the region is similarly a product of deliberate man-made exploitation of the institutions and resources of the region.

(5) This "artifactual", rather than natural, characteristic of the Region suggests uncertain consequences for the future of the Harbour, its watershed and the communities within its territories. This is because the current state of the physical, biological and socio-economic structures in the watershed have been constructed in response to political events -- warfare in particular -- outside the region.

(6) The success of economic market activities in the Harbour contrast vividly with the deterioration of the non-market conditions of the Harbour, particularly water quality conditions and the diversity and multiplicity of aquatic species. The reasons for these apparent trade offs will be the subject of future Copps Chair Reports.

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# PART I

## The Bay and Its Uses

Hamilton Harbour is the major naturally protected harbour on Western Lake Ontario. Its waters measure some 40 square kilometers and are accessible to Lake Ontario by a man made ship canal completed in 1830.[1]

This site helps sustain three major uses. The harbour is a port that receives between 400 and 1000 vessel arrivals during the ice shortened season of the St. Lawrence Seaway shipping transportation system.[2] Many of these vessels carry raw materials for two steel making plants located on the foreshores of the harbour. Indeed the foreshores are predominantly allocated to either port related facilities (wharves, warehouses and terminals) or industrial sites, present and planned.[3] In many respects, the Harbour is the hub of the local and regional economies.

The Harbour is, however, a natural resource that sustains a number of alternative uses. A major use is for the free disposal of liquid wastes. Approximately 27 billion gallons of liquid wastes are discharged from industrial and municipal outfalls on an annual basis; this is equivalent to 40% of the volume of the receiving waters. Some of the pollutants in

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1. Mark Sproule-Jones, Legal Foundations for the Uses of Hamilton Harbour, Copps Chair Occasional Report No. 2, McMaster University, 1985, p. 1.

2. The figures are the lower and upper bounds of vessel arrivals since 1976. See Hamilton Harbour Commissioners Annual Reports 1979-84.

3. 67% of the shoreline of 45 kilometres is allocated to industrial and transportation uses. See Sproule-Jones, op.cit., p. 4.

these waste waters are treated, and some others are diluted before discharge. The Harbour also receives runoff from a watershed of over 500 square kilometres, and these untreated waters (apart from the area of the City of Hamilton's combined septic and storm drains) amount to 41% of the volume of the receiving waters. It takes only three months for the Harbour to flush itself into Lake Ontario, but the resident waters and sediments exceed conventional standards for most kinds of water pollutants.[4]

Recreation - both pleasure boating and passive recreation on the foreshores of the Harbour - is another major use of the Harbour. It is estimated that sailing, canoeing, kayaking and motorboating involve anywhere between 175,000 and 350,000 Hamilton residents in any one year.[5] Walking, cycling, birdwatching and ice-skating are other recreational activities on the Harbour and its foreshores, although only 7% of the shoreline is currently classified as open space and one-half of this is occupied by boating marinas.[6]

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4. Water quality management for the Harbour will be the subject of a future Copps Chair Occasional Report. The figures in this paragraph are drawn from R.V. Forde, A Historical Study of the Pollution of Burlington Bay, Department of Municipal Laboratories, City of Hamilton, 1979; Ministry of Environment, Hamilton Harbour, Technical Summary and General Management Options, Government of Ontario, 1985.

5. These figures and the methodology for their calculation will be detailed in a subsequent Copps Chair Occasional Report on pleasure boating in the Harbour.

6. Sproule-Jones, op.cit., p. 3.

The Harbour also once supported a thriving commercial and recreational fishery.[7] Because of infilling of spawning areas for expanded industrial sites on the southern and eastern shores of the bay, and because of sustained water degradation, these fisheries have disappeared. However, a variety of fish species, macrophytes and benthic invertebrates still populate parts of the Bay, and the prospect of improved dissolved oxygen levels may presage a modest revival of these traditional uses of the Harbour.

Finally the Harbour waters are used for industrial water supply. Some 2.3 million cubic metres are withdrawn daily, mostly for cooling water processes in the steel mills. 96% of this volume is returned to the Bay after use.[8] Domestic water supply in the watershed is furnished largely from Lake Ontario. The City of Hamilton relied on wells and springs for domestic water supply prior to 1860, when water began to be pumped from Lake Ontario through a natural sand bar (for filtration) for storage and later distribution.[9]

The present pattern of uses of Hamilton Harbour has evolved for a number of reasons. First, the structure of laws regulating the uses of the Harbour has placed priority on shipping and navigation and allied port activities. Waste disposal is a second priority. Recreational and fisheries uses are of lesser priority, to the extent that the latter has

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7. J.A. Holmes and T.H. Willans, Historical Review of Hamilton Harbour Fisheries, Canadian Technical Report of Fisheries and Aquatic Sciences No. 1257, Government of Canada, Fisheries and Oceans, 1984.

8. Ministry of Environment, op. cit., p. 10.

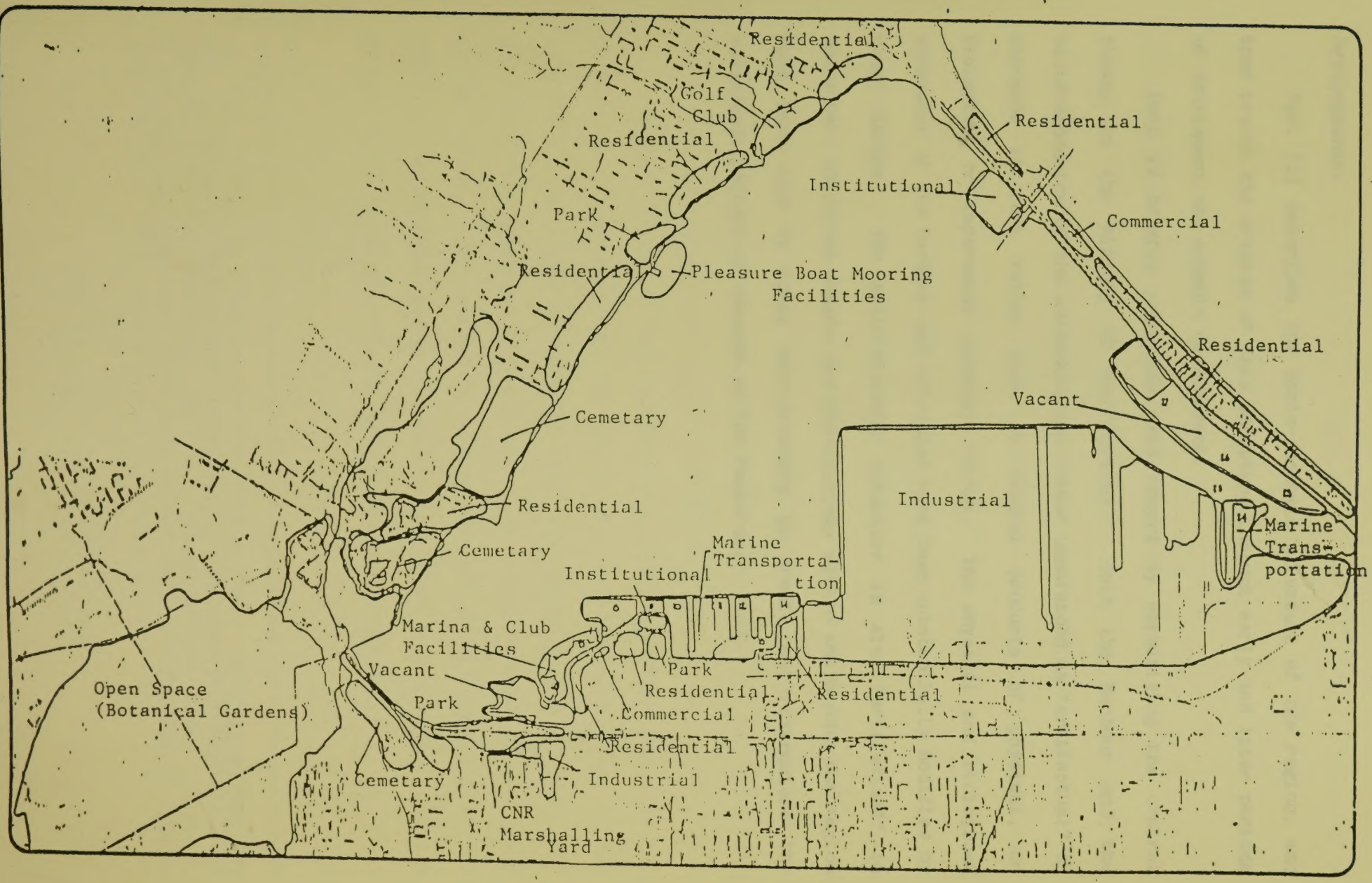
9. C.M. Johnston, The Head of the Lake, Wentworth County Council, 1958, pp. 193-194.

disappeared from the Harbour itself, and was finally banned in 1948. Governments, especially the Provincial Government of Ontario which has predominant jurisdiction in the environmental and fisheries area, have not seen fit to alter the priorities amongst the waste disposal and recreational uses.

There are, however, other reasons for the present pattern of uses. The Harbour is a natural resource available for use and exploitation in a variety of ways. Its physical characteristics create opportunities for use and constraints on its usage. In addition, the communities in the watershed place direct and indirect socio-economic demands on the Harbour. Its location within an urban, industrialized watershed creates incentives and opportunities for uses that the Harbour may not adequately be able to bear. Conflicts and incompatibilities amongst uses are probable when the institutional arrangements (laws, regulations and organizations) do not adequately ration and balance these demands on the Harbour.

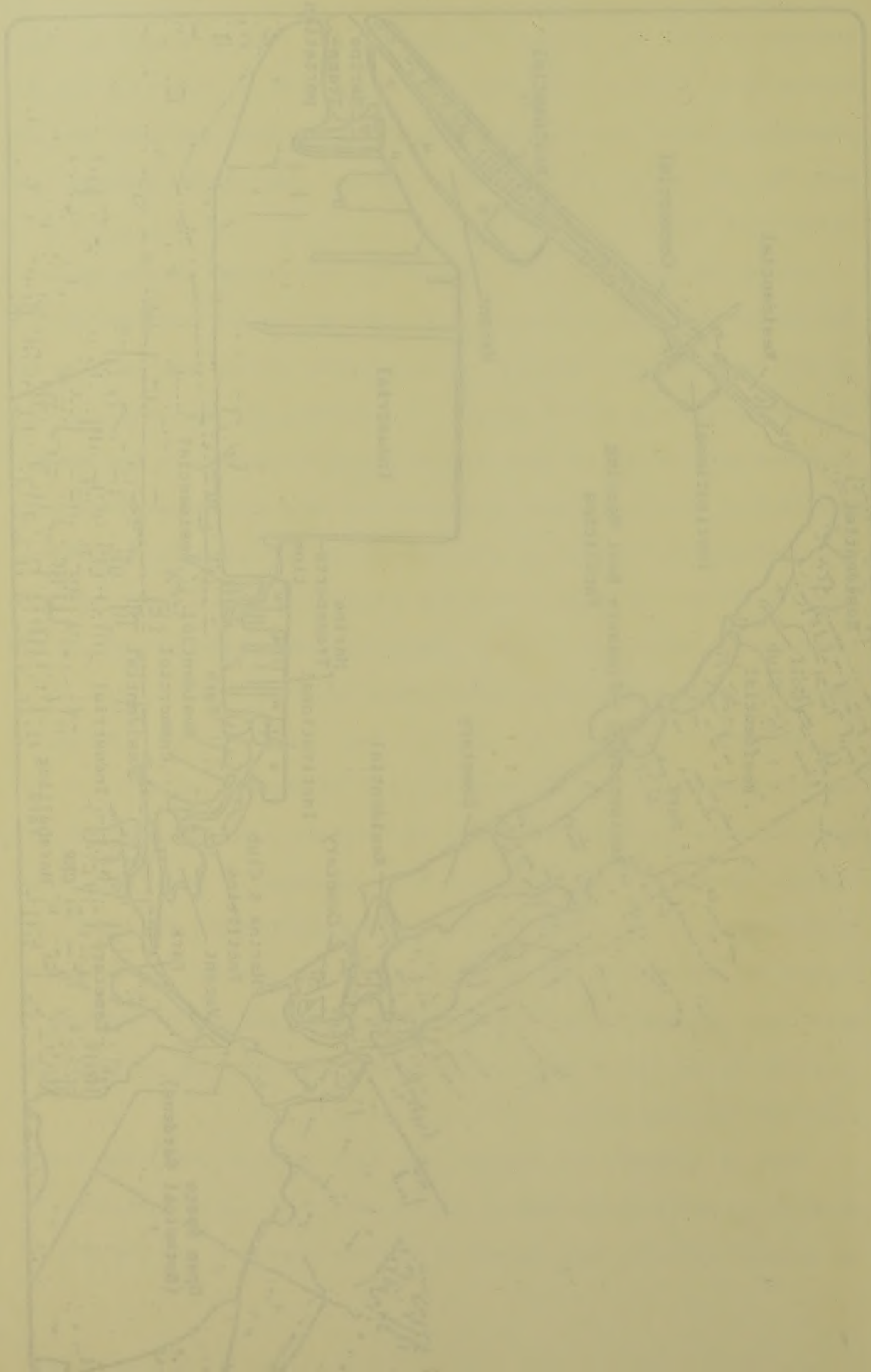
In this report, we examine the physical and biological characteristics of the Harbour and its watershed, as well as the socio-economic characteristics of the region that place direct and indirect demands on the resource. The approach is historical. The present state of the resource and of the socio-economic structure is a product of past events and decisions within and without the area. An historical approach enables the reader to understand the difficulties in altering the pattern of uses in the harbour when they may be formed and inherited over many years.

Part II examines the changes that have occurred over time in the physical structure of the Harbour and the watershed. It also examines how the aquatic ecologies have changed in response to natural and man-made




Foreshore Uses of Hamilton Harbour

(Source: Hamilton Harbour Port Master Plan, 1978, page 23.)



developments.

Part III describes the socio-economic structure of the region, and then traces the origins of this structure through early and later periods of settlement and econoic development.

Part IV briefly concludes this report by emphasizing the central themes in the history of the Harbour. Both the Harbour and the socio-economics of the watershed are better understood as "artifactual" or man-made in form rather than as natural products of physical, or biological or impersonal economic forces. The physical and biological character of the harbour and watershed have been substantially modified by human design. The socio-economic structure is also "artifactual" in character; political events and institutions within and beyond the region have been used by local entrepreneurs to create and restructure the subsequent pattern of demands on the resource.

# PART II

## The Resource

### Physical Structure of the Harbour and Watershed

The last glaciation period established the basic physical structure of Hamilton Harbour. During this time, an ice lobe occupied the Lake Ontario basin and the adjacent lands. These lands included the Niagara Escarpment - an area of massive dolomite capping soft, easily eroded shales.[10]

The melting of the ice produced a series of lakes in North America, including Lake Iroquois. The surface of this lake at Hamilton was some 34 metres higher than the present Lake Ontario, and the action of waves at this time contributed to erosion from the escarpment face and deposition along the shore in a series of sand and gravel bars.

When the weight of the glaciers was finally removed, Lake Ontario emerged as a consequence of the uplift of the North-Eastern part of the continent. The Lake flooded the area now known as the Harbour, and penetrated and submerged the area known as Cootes Paradise or the lower Dundas valley. At this time, a sand bar was formed that joined the Northern and Southern shores of the Harbour, apart from a natural shallow outlet in the North-East of the Harbour and now filled in.

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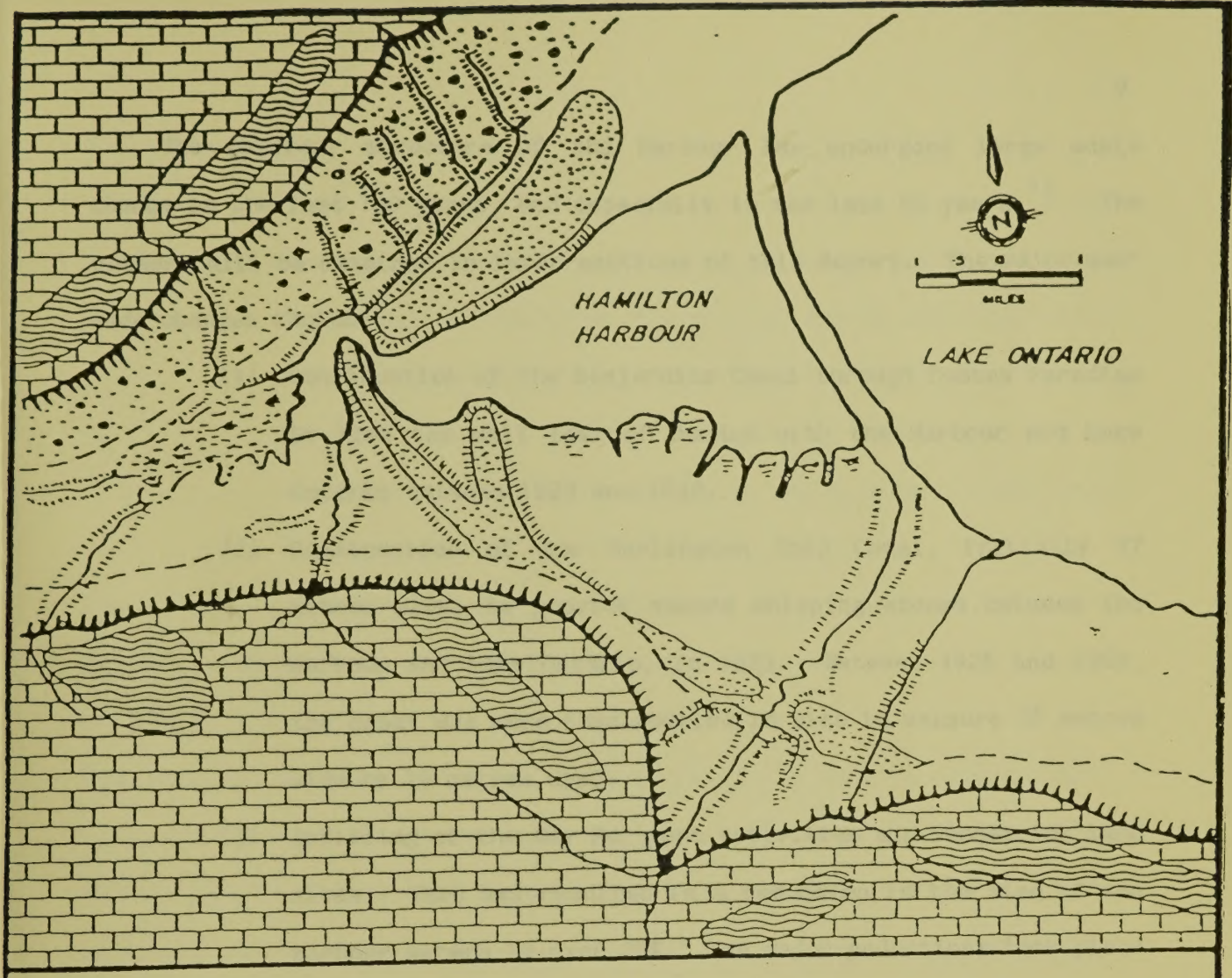
10. This section is based on the following sources: Information Hamilton '81, Planning and Development Department of the Regional Municipality of Hamilton-Wentworth, Hamilton, 1981; D.F. Putman and R.G. Putman: Canada: A Regional Analysis, Dent 1979; L.D. McCann (ed), A Geography of Canada, Prentice Hall, 1981.




LEGEND

- IROQUOIS SAND AND GRAVEL BAR
- LAKE IROQUOIS SHORELINE
- NIAGARA ESCARPMENT
- LIMESTONE PLAIN
- SHALE
- MORAINE
- MARSH

Source: City of Hamilton: General Background Information p. 6

After H. A. Wood

# SITE OF HAMILTON

SITE OF HAMILTON

The physical structure of the Harbour has undergone large scale change in the last 150 years, and especially in the last 50 years.[11] The reasons will be examined in later sections of this Report. The major man-made changes include:

(1) Construction of the Desjardins Canal through Cootes Paradise to link the mill town of Dundas with the Harbour and Lake Ontario between 1823 and 1830.

(2) Construction of the Burlington Ship Canal, initially 27 metres wide, to provide secure shipping access between the Harbour and Lake Ontario, in 1823. Between 1926 and 1969, the canal was more than doubled in size to measure 88 metres wide by 10 metres deep.

(3) Infilling of the Bay for port activities and industrial land sites. This has resulted in a reduction in the size of the Harbour waters by over 20%. The major reductions took place between 1926 and 1982 when the total area of open water was reduced from 27.8 square kilometres to 21.6 square kilometres. A comparison of the first two maps in this Report (pages 5 and 8) indicates the large scale physical changes that have occurred especially on the Southern shores.

(4) Non point source runoff from the watershed, point source discharges and dredging especially in the Twentieth Century.

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11. This section is based primarily on evidence in: P.V. Hodson and R.W. Threader, Historical Review of the Water Quality of Hamilton Harbour, Cootes Paradise and Western Lake Ontario, Canadian Technical Report of Fisheries and Aquatic Sciences, Government of Canada, Fisheries and Oceans; and Holmes and Willans, op.cit.

> These changes to the Harbour have resulted in bottom materials consisting largely of mud, silt and clay, replacing the extensive stretches of gravel and sand bottom. Organic bottom materials that once covered Cootes Paradise, the north and easternly areas and the southern inlets are now limited, because of infilling and burying, to the Cootes Paradise and north-western corner of the Bay.

The physical structure of the watershed has also undergone substantial change. Much of the forest in the watershed was cleared by pioneer farmers in the first half of the nineteeth century.[12] The types of trees that prosper, and the types of agricultural crops that are predominant, vary largely with the three types of soils that exist in the watershed. The escarpment and uplands have a Silarian geological base on which the soils are of two main kinds -- limestone and clay. The limestone areas to the north of Hamilton have top soil depths of 10 centimetres or less and are covered with grasses, deciduous trees (such as maple, beech and basswood) and the expanding edges of suburban and ex-urban settlements. The clay soils in the eastern part of the watershed have over 35 centimetres of top soil and became known in the twentieth century as part of the "Niagara Fruitbelt". Maple, ash, hickory are standing forest species, although the lands are also subject to urban and suburban sprawl.

Lands below the escarpment consist of sandy dry plains, intermixed with moist sites of clay and marsh land. Much of the marsh land adjacent to the Harbour has been filled and other clay sites are spliced by tiling

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12. Putnam and Putnam, op. cit., pp. 194-95.

and drainage ditches.

Five creeks flow into the Harbour from this watershed. Table I describes the area and proportion of the watershed of each of the creek areas and the City of Hamilton.

Table I: Watershed Areas

| Region | Area (sq.miles) | Percentage of Watershed |
|---|---|---|
| Spencer Creek | 76 | 40% |
| Mineral Springs Creek | 18 | 10% |
| Rock Chapel Creek | 8 | 4% |
| Grindstone Creek | 34 | 18% |
| Red Hill Creek | 24 | 12% |
| City of Hamilton | 30 | 16% |

Source: A.V. Forde, A Historical Study of the Pollution of Burlington Bay, City of Hamilton, Dept. of Municipal Laboratories, 1979, p.10

Thus the physical structure of both the Harbour and its watershed have undergone substantial natural and man-made changes. The man-made changes have mainly occurred and quickened in the last century.

## Aquatic Ecologies

The biology of Hamilton Harbour has changed dramatically in the last century.[13] The ecological systems have not simply evolved; they have been substantially modified by changes in water chemistry (due to pollution) and changes in fishing effort (due to pollution and also overfishing on occasions). Generally, there has been a decline in both the multiplicity and diversity of biological species, two accepted indicators of environmental degradation.

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13. This section is based on the excellent review provided by Holmes and Willans, op. cit.

First, the abundance and distribution of benthic invertebrates that provide food for fish species have been reduced. Some species disappeared in the late Nineteeth Century, and others in more recent years. The southern shores contain no benthic invertebrates at all because of complete anoxia or sediment chemistry. Other areas, such as Cootes Paradise are still home to abundant numbers of invertebrates such as snails, crustaceans and oligocheate worms.

Second, the quantity and quality of the marsh area that provides habitat for fish and wildlife species has substantially declined. Some three quarters of the marsh community in Hamilton Harbour has disappeared in the last 150 years.[14] Even in post-war years the abundance and diversity of aquatic plants has been reduced. In the relatively unaltered Cootes Paradise, for example, the number of macrophyte families, genera and species dropped by approximately one-half between 1949 and 1972.[15] Substantial nutrient enrichment of the Harbour has produced major changes in the dominant plankton taxa.

These changes have led to major changes in the abundance and distribution of fish species in the Harbour. Cold water species, such as trout, herring, and whitefish, were abundant in the Harbour in the Nineteeth Century, and they sustained large commercial and sport catches. These species began to decrease and show signs of stress before the turn of the century due initially to over-exploitation. The loss of habitat and low dissolved oxygen levels in the lower layers (thermocline and

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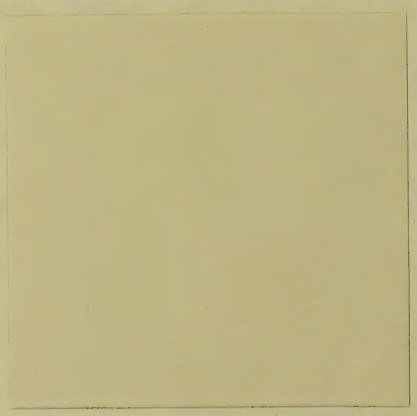
14. T.H. Willans, "Changes in Marsh Areas along the Canadian Shore of Lake Ontario", Journal of Great Lakes Research, Vol. 8, No. 3, pp. 570-77, cited in Holmes and Willans, ibid, p.65.

15. Holmes and Willans, ibid, pp. 62-63.



hypolimnion) of water in Summer months were major contributors in the total collapse of these fisheries in the 1930's and 1940's. Warmer water species such as catfish and especially carp continue to provide angling opportunities on the Northern and Western shores, including Cootes Paradise. The ship canal to Lake Ontario provides further recreational opportunities to catch smelt, coho salmon and trout. Recent studies have captured examples of 39 fish species in Hamilton Harbour, with a greater abundance of smaller short-lived species. Some larger resident species display indications of toxic water quality conditions; white sucker fish, larger than 40 centimetres, appear highly susceptible to lip papillomas (tumours).[16]

## Conclusion

Changes in the physical structure and ecologies of watersheds and bays are to be expected even in wilderness areas. The changes that have occurred in Hamilton Harbour and its watershed suggest much more than normal rates of evolution. Man has made substantial changes to the physical structure of the Harbour and upland areas. The Harbour itself is smaller, and its water chemistry and bottom materials much different from what one would expect from natural evolution. The upland areas too have undergone major changes as demands for agricultural, industrial, commercial and domestic lands have replaced and restructured the physical

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16. Great Lakes Water Quality Board, Report on Great Lakes Water Quality 1983, Appendix: Great Lakes Surveillance, International Joint Commission, 1984, p. 125; Ministry of Environment, Hamilton Harbour, Technical Summary and General Management Options, Government of Ontario, 1985, p. iii.

geography of the region.

Finally, the ecological systems associated with the Harbour and its tributaries have changed. Lower forms of biological life have been eliminated in some areas and changed in character in others. There is less abundance and diversity of biological life than one would anticipate from natural evolutionary change of aquatic ecologies.

Hamilton Harbour is thus as much a man-made artifact as it is a natural resource. It is a product, in part, of the socio-economic processes of the region. The history of these socio-economic processes is the subject of Part III of the Report.

# PART III

## Socio-Economic Structure

### The Present Situation

The Hamilton Harbour watershed is the home for over 500,000 persons. Some 300,000 of these live within the municipal boundaries of the City of Hamilton, and the others within the municipalities of Burlington, Dundas, Ancaster and Stoney Creek. The local governmental structure overlaps and divides the watershed of 900 square kilometres. Hamilton, Dundas, Ancaster and Stoney Creek are four of six "lower tier" municipalities (the others being Flamborough and Glanford) within the "upper tier" Regional Municipality of Hamilton-Wentworth under a two-tiered local government system established by the Province of Ontario in 1974. Burlington is a "lower-tier" municipality within the adjacent Regional Municipality of Halton. Hamilton Regional Conservation Authority, a special board dependent on both Regional and Provincial Governments for funding and statutory authority, is a major governmental body responsible for conservation and flood control in the basin. The uses of the Harbour itself are regulated and managed by a number of Federal, Provincial and local governmental agencies.[17]

Population growth in the area is significantly less than in the rest of Ontario and the rest of the country. In the last complete census decade (1971-1981), population in the Hamilton Census Metropolitan Area rose 7.6% compared with 11.7% for Ontario and 12.5% for Canada as a

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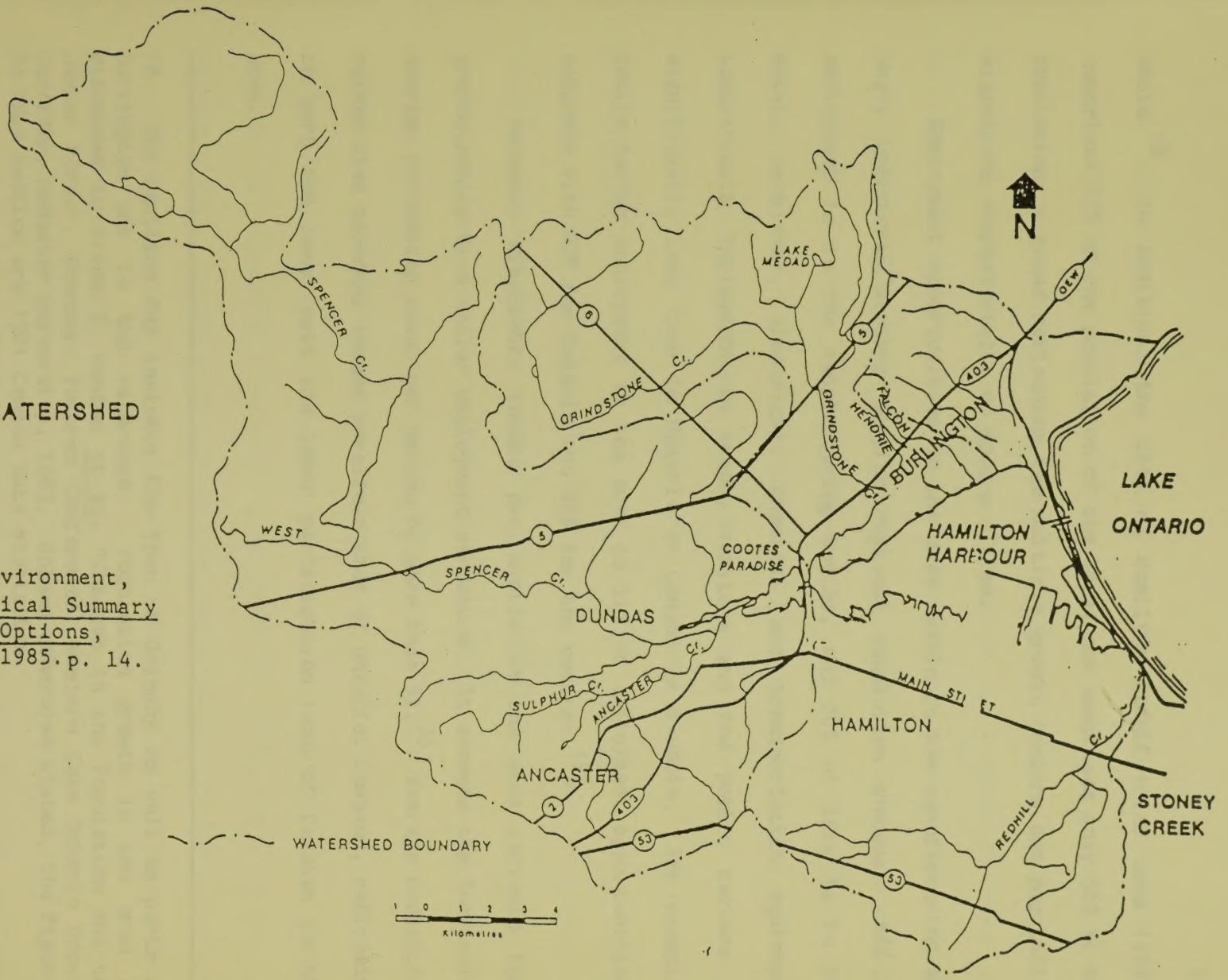
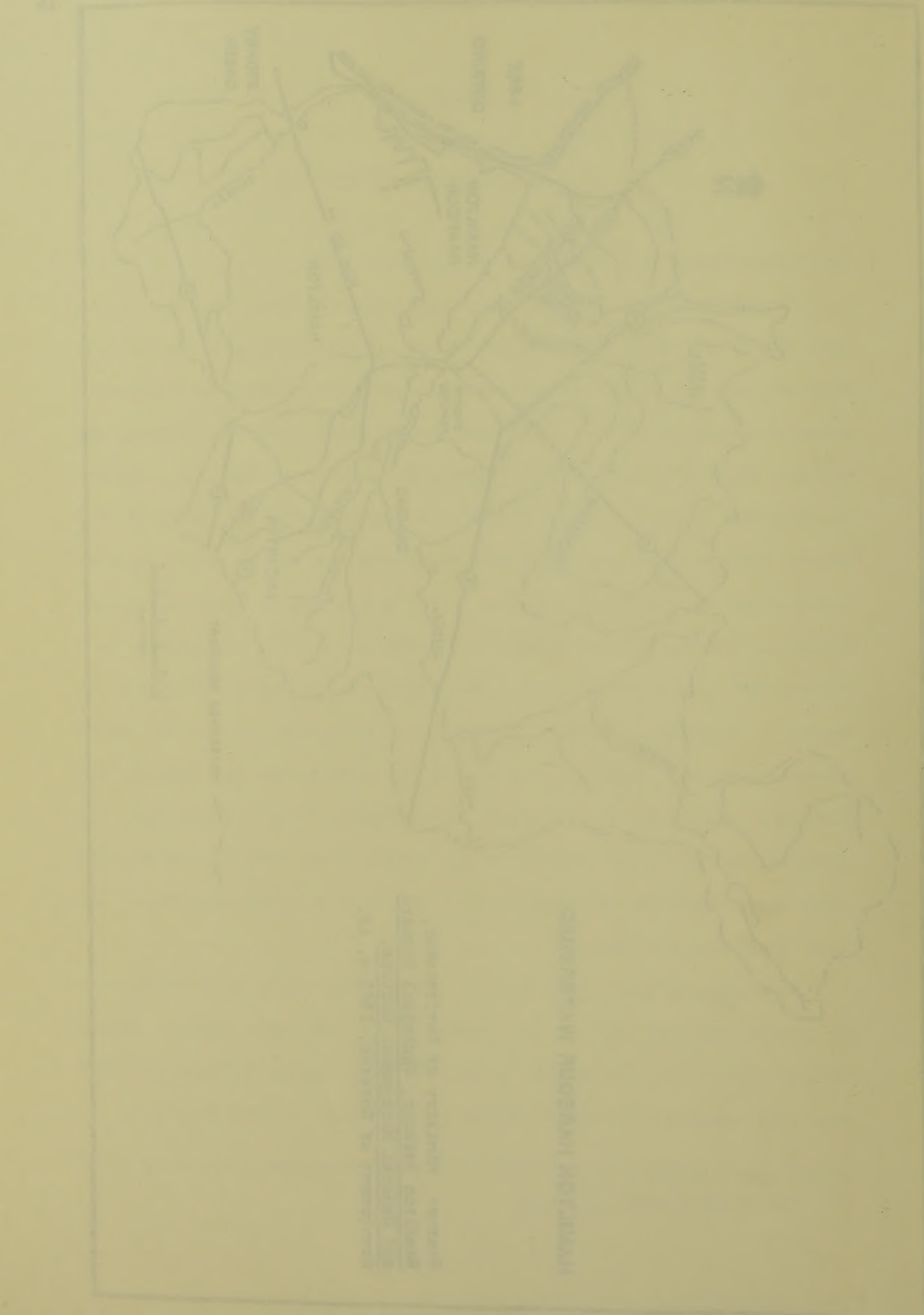
17. See Sproule-Jones, op. cit.

## HAMILTON HARBOUR WATERSHED




Source: Ministry of Environment, Hamilton Harbour, Technical Summary and General Management Options, Government of Ontario, 1985. p. 14.



whole.[18] In addition, the City of Hamilton itself which once (1931) comprised 82% of the population of the area, now comprises only 56% of the population, a trend reflecting the multiple growth centers and population migrations characteristic of modern cities.

Employment opportunities in the area remain in the manufacturing and heavy industrial sectors despite regional population changes. 56% of employment is in the manufacturing sector, and 70% of this is in the metal, machinery, electrical, chemical and transportation equipment industries. Employment in trade, services and the public sectors is significantly less than in Ontario or Canada as a whole. For example, public sector employment in the area is 11% of employment opportunities, compared with 22% for Ontario and 26% for the country.[19]

Personal disposable income per capita in the area reflects this predominantly blue collar employment structure. It exceeds the Provincial average purchasing power per person by more than 5%.[20] Average household rather than personal income parallels that of Ontario, however, reflecting in part the lower paid and lower participation rate of females in the area.

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18. The Hamilton CMA includes the Town of Grimsby as well as parts of Burlington not in the watershed. Population growth in the area is discussed in Frank T. Denton et al, "Changes in the Population and the Labour Force", Economic Futures Conference: Western Lake Ontario Growth Corridor, McMaster University, 1983. Unless otherwise stated, the figures in this section are 1981 Census data statistics.

19. Further details are found in Mark Sproule-Jones, "Government as a Catalyst for Economic Development", Economic Futures Conference: Western Lake Ontario Growth Corridor, McMaster University, 1983.

20. R.W. Thompson, "The Economy of Metropolitan Hamilton", Economic Futures Conference: Western Lake Ontario Growth Corridor, McMaster University, 1983.

At the present time, then, Hamilton and its neighbouring communities within the watershed is a relatively slow growth area, dependent for employment largely on the manufacturing and heavy industrial sectors. Population shifts within the area reflect the deconcentration of activities within the older central city, the locational competition of economic activities within the region and also locational competition within the adjacent urban communities of Oakville, Mississauga and Metropolitan Toronto. Economic competition is one of the enduring historical traits of Hamilton, and to this history we now turn.

## The Early Years

The socio-economic history of Hamilton is, curiously, a history of politics in two different senses.[21] First, Hamilton's economy and society have developed because of political and military events outside the region. Secondly, indigenous entrepreneurs -- political as well as economic -- have used political institutions at the municipal, provincial and national levels to develop, redirect and restructure the economy. Hamilton is consequently as much an artifact of human design as is its Harbour. These two political factors may also account for the persistent "booster" culture of this "artifactual" City and region, as well as many other cities in Canada.

The early years of Hamilton's development -- defined as the years prior to the Canadian Confederation of 1867 -- reflect these two political factors. The earliest settlers were Native Indians of the Attawandaron

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21. In this section, Hamilton is used to describe both the City and other communities within the watershed of Hamilton Harbour.

tribe who tried to maintain a neutral position in the tribal warfare of the Seventeenth Century.[22] They were eventually eliminated by the Seneca Indians following their weakening by the plague and by the loss of tribal leaders. Early European settlers preferred to locate away from the "head of the lake" and closer to water transportation routes such as the St. Lawrence River and the portage between Lake Ontario and Lake Erie.

It was the American Revolution and its aftermath, including the War of 1812, that laid the foundation for the early development in the region. Refugee Loyalists were attracted to the settlements of Dundas and Ancaster to exploit the milling potential of the swift flowing Spencer's Creek and Ancaster Creek respectively. Governor Simcoe reinforced the development of the Dundas area by building a military road from the end of the marsh in Burlington Bay to the head of navigation on the Thames River.[23] This military road, begun in 1793, was designed to maintain links with the interior of the continent should the Niagara frontier fall to the Americans. It had the effect of emphasizing Dundas as the outfitting and forwarding town for the interior.

The 1812 War provided the "take-off" for the development of Hamilton itself, an area previously and sparsely populated by squatter farmers. The British regular and militia forces were garrisoned on Burlington Heights (now in the Flamborough Municipality) and provided both a measure of security for the inflowing population and a demand for local products

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22. Johnston, op.cit., pp. 8-10; John C. Weaver, Hamilton, Lorimer, 1982, pp. 9; R.T. Woodhouse, History of the Town of Dundas, Parts 1,2,3, Dundas Historical Society, 1967, p.4.

23. G.M. Craig, Upper Canada - The Formative Years 1784-1842, McClelland and Stewart, 1963, p 35. The road was later extended to Toronto and Simcoe.

and services.[24]

Two post-war political decisions of the Government of Upper Canada stimulated the development of the new community of Hamilton. First, the political influence of George Hamilton (after whom the city is named), his father and former member of the Legislative Assembly Robert Hamilton, local member of Legislative Assembly James Durand, and local wealthy merchant Nathaniel Hughson ensured that the site for a new District township would be on land owned by Hamilton and formerly owned by Durand. From that time (1816) until 1841, appointed Justices of the Peace would organize and implement judicial, legislative and administrative functions from the District townsite, and redirect local governmental business from Niagara-on-the-Lake to the South and York to the East.[25]

Second, the Government of Upper Canada financed the digging of a canal through the "beach strip" sand bar in 1823 to enable merchant vessels to enter directly into Burlington Bay and to berth at the Hamilton waterfront. Almost immediately four wharves were built on the Hamilton waterfront, allied warehouses constructed, and Hamilton superseded Dundas as the storage, outfitting and distribution centre for western Lake Ontario.[26] Attempts to restore Dundas' central role by building a man-made canal to the Bay, with private and governmental funds, proved

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24. J.W. Watson, "Industrial and Commercial Development" in A.H. Wingfield (ed.), The Hamilton Centennial, 1846-1946, The Hamilton Centennial Committee, 1946, p. 14. Stoney Creek was the site of an important strategic battle on June 5, 1813. The American forces were routed at night and with the exception of an isolated naval chase in 1813, the warfare moved to other areas of the British Colony. Margorie Freeman Campbell, A Mountain and a City: The Story of Hamilton, McClelland and Stewart, 1966, pp. 42-43.

25. K. Grant Crawford, Canadian Municipal Government, University of Toronto Press, pp. 22-29.

commercially unviable.[27] The advent of steam rather than water driven milling, the growth of banking and insurance companies, and the increasing imports and exports passing through the Harbour all led to the absolute and relative growth of Hamilton in the region during the 1830's and 1840's.

Political and economic entrepreneurship created the next major developmental stage in Hamilton's growth. Sir Allan Macnab, the local member of the Legislative Assembly, was at the centre of successful organized attempts to construct a railroad from Toronto to Buffalo through his lands adjacent to the Harbour. The organization required capital from the Great West Railroad in London and, more important, decisions of the Province (1849) to guarantee railroad debt of lines more than 75 miles once half the line was completed and (1851) to permit municipalities to undertake railroad subscriptions on behalf of their tax payers. The newly incorporated City of Hamilton pledged a stock subscription of £50,000 in 1851, when the total tax assessment of the City was only £94,000.[28] The railroad was opened in 1853 and fully operational by 1854. It connected the Harbour with the rail network of New York and that of Central Michigan, as well as connecting Hamilton to its hinterland and the City of Toronto. Once more, politics and political institutions made viable the

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26. Weaver, op.cit., p. 16.

27. The Desjardins Canal was built between 1826 and 1837 with $31,000 of private funds and $68,000 from the Government of the Colony. Neither the interest nor the principal were repaid. William Kingsford, The Canadian Canals, Rollo and Adam, 1865, pp. 80-81.

28. Johnston, op.cit., p. 135. Locally elected municipalities were made possible by the District Councils Act of 1841 passed by the United Parliament in the same year. Hamilton incorporated in 1846.

economic growth of Hamilton.

The remaining years before Confederation resulted in a short run boom and growth, and a decade of recession and decline. The economic entrepreneurship of Hamilton's political elites proved disastrous to the City. The municipality had invested £104,600 sterling and $91,470 colony currency in four different railway schemes, and embarked on major public works including a water works scheme to pump water from Lake Ontario. The public works added £107,550 sterling and $46,789 colony currency to the debt load.[29] In 1861, Hamilton defaulted on its interest payments and the Province "bailed out" the City. Two years later, the Province refused a similar grant, and creditors eventually accepted restructured terms for the debt.

Hamilton's City Fathers had seriously misjudged the effects of economic competition from rival areas at home and abroad. Repeal of the Imperial Corn Laws resulted in freer trade between Britain and non-colonial countries of the world. The European revolutions of 1848 restricted alternative sources of demand for agricultural products. Americans built railroads south of Lake Erie to divert traffic flowing to Michigan through the British Colony. And the Grand Trunk Railroad, deliberately by-passing Hamilton, consolidated the dominance of Toronto and Montreal as the major import-export centers of the united colonies (now known as Ontario and Quebec).[30] The Hamilton area would need major help to exploit the potential of its harbour and watershed and to maintain

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29. The New Topographical Atlas of the Province of Ontario ..., Miles, 1979, p. XVII. £1 sterling equalled $3.85 colony currency.

30. J.M.S. Careless, The Union of the Canada 1841-1857, McClelland and Stewart, 1967, pp. 113-125; Weaver, op.cit., pp. 50-52; Johnston, op.cit.,

(Footnote continued)

employment for its lessening population. Political events in and outside the region in the next 50 years would provide such help.

The Middle Years

The period from Confederation to the end of the First World War represented the major years of growth and consolidation of Hamilton as an industrial and commercial centre. It was the period when the heavy industry of Hamilton became firmly established, and when the Harbour became significant as a site for industrial location and as an import-export docking centre. But these changes would not have occurred without major political events, especially national tariff policy and (of course) World War I. The small town service centre of 27,000 people became an industrial centre of quadrupled size.

Hamilton's industrial base at Confederation was established and linked to the iron industry, with the manufacture of stoves and farm implements as well as the rerolling of imported railway tracks the major elements. The continuing entrepreneurship of City politicians and business elites led to a five year property tax holiday for new industries and a five year tax exemption for new machinery for existing business.[31] The policies of the Dominion Government after 1878 were also significant in expanding the iron and steel industry. Not only was a large duty set on finished iron imports, but the doubling of the import duty on Scottish pig iron meant that an expansion of Hamilton's own peg iron production and

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(continued)
pp.187-201.

31. Campbell, op. cit., p. 137.

rolling mills was feasible. The Dominion further offered a bounty to indigenous iron producers and the municipality offered free land, cash bonuses and long term tax exemption.[32] The removal of tariffs on the import of bituminous coal completed the set of favourable institutional arrangements for the development of iron and steel in Hamilton. Iron ore from Lake Superior and coal from Appalachia could reach the Harbourfront by relatively cheap water and rail transportation, and be made and finished into the products of an expanding agricultural economy including now the emerging Prairie lands.

The success of these moves attracted the Hamilton Blast Furnace Company and led the city to grant ten year tax concessions on any new industries and even greater bonuses for specially favoured companies, like the John Birge Company which is the forerunner of the Steel Company of Canada.

More classical kinds of entrepeneurship brought hydro-electrical power from DeCew falls some 35 miles from the City and began the basis of the electrical appliance industry centered around Westinghouse. Similarly, the area became a major agricultural canning and meat packaging centre for both export and domestic consumption and a major centre for the manufacture of farm implements. And the availability of cheap electrical power, low cost raw material imports especially cotton, and increasing waves of unskilled immigrants enabled the cotton and clothing industry to exceed the foundry and machine products industries in terms of capital invested and total employment by the turn of the century.[33]

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32. R.D. Roberts, The Changing Patterns in the Distribution and Composition of Manufacturing Activity in Hamilton between 1861 and 1921, M.A. Thesis, McMaster University, 1964.

The early months of World War I disrupted European demand for agricultural products and the derived demand for farm implements, and deepened the emerging economic recession of the times. By 1915, however, the production of munitions, farm products for war-torn Europe as well as for troops, and military recruitment itself sharply reduced unemployment and contributed to the continuing restructuring of the economy from a small service centre to a large industrial centre that could capitalize on political events and arrangements beyond its boundaries.[34]

Like many comparable Victorian developments, the industrial changes in Hamilton took place adjacent to water and railroad transportation systems. Even the newer industries powered by electricity rather than steam concentrated in the same areas in Hamilton because of the availability of cheap uninhabited land. The swampy land and ravines that made residential settlement impractical but were important parts of the Harbour's ecosystems, were now infilled as sites for new and growing industries.

As pressure for industrial location adjacent to the Harbour waters grew, the municipality successfully petitioned the Dominion to operate the navigation and shipping function of the port. In 1912, the new Hamilton Harbour Commission was established, with two Dominion and one municipal appointees to its Board of Commissioners. The new Commission embarked on land reclamation as well as expanded wharfage, and these presaged a later period of conflict with alternative goals of the municipal government. But later years brought fewer structural changes to the region's economy.

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33. Census of Canada, 1901, pp. 184-185; Roberts, op.cit., p.98.

34. Weaver, op.cit., pp. 89, 91.

Modern Times

World War I brought not only a booming economy to Hamilton. It also brought rapid population growth as immigrants from abroad and at home sought the increasing numbers of unskilled jobs in the new manufacturing industries. Hamilton's population increased from 82,000 in 1911 to 114,000 in 1921, to match a proportional increase in the previous decade and comparable increase in the subsequent decade. Outlying communities in the watershed gained little of this population increase. Ancaster, for example, was the same size in 1941 as 1871, and Dundas had only increased from 3,000 to 5,000 persons in the same 70 year period.[35] The following table (Table II) indicates in gross terms how Hamilton dominated the watershed communities at the end of World War I, continued to do so until 1951, and has played a lesser role since that time as population and employment opportunities have grown proportionately more without rather than within this Victorian city.

TABLE II

Population in Selected Watershed Communities: 1921-81

| Year | Hamilton | Burlington | Stoney Creek | Dundas | Ancaster |
|---|---|---|---|---|---|
| 1921 | 114,151 | 2,709 | n/a | 4,978 | 5,586 |
| 1951 | 208,321 | 6,107 | 1,922 | 6,846 | 7,648 |
| 1981 | 306,434 | 114,853 | 36,762 | 19,586 | 14,428 |

Source: Census of Canada, 1941, 1971, 1981.

The 1920's were times of continued growth and prosperity for

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35. Census of Canada, various years.

Hamilton, once the readjustment of the economy to peace time conditions were made. Industrial production, especially in the heavy capital intensive industries, grew at war time rates in response to demands from the transportation, agricultural, and construction industries. It would then be cut almost in half by the years of the Great Depression, as the "new" economy of Hamilton was dependent on the state of the economy in the rest of Canada and abroad. Not until 1939 did the value of production rival that of 1925 at $152 million.[36] 1933 was the worst year; one quarter of Hamilton's families received relief payments during that Spring, despite the fact that the textile mills had quickly recovered and reached 90% of capacity.[37]

Once more the "worst kind" of political event, another world war, was to revive the regional economy and create growth and development in production and employment. Growth occurred in precisely those sectors that had profited from World War I. The value of gross production reached $363 million in 1944, and employment levels increased by more than a third.

The economic entrepreneurship of Hamilton's political elites did not diminish during the booming 1920's or the depressed 1930's. The tradition of using political institutions for economic gain and development manifested itself most notably in the activities of the Hamilton Harbour Commissioners. During these years the Commissioners began an aggressive policy for expansion and development that rested on two complementary

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36. Dominion Bureau of Statistics, The Manufacturing Industries of Canada, Section G: Geographical Distribution, Ministry of Trade and Commerce, 1925-1967.

37. Weaver, op.cit., p.135.

strategies. First, the Commissioners wanted to see a large scale expansion of the port activities, but at no cost to the shipping industry itself. Second, the Commissioners wished to use their lands and water lots as convenient sites for industrial development, fully cognizant of previous infilling and the demand for space north of the escarpment.[38] Both strategies were successful as the following paragraphs indicate.

Shipping activities in the Harbour increased spectacularly during the 1920's and continued to increase during the Depression and war years. One measure of shipping activities is tonnage imported and exported, and these were a trivial 80,000 tons in 1925.[39] By 1931, they exceeded 1-1/2 million tons, were over 2 million tons in 1935, 2-1/2 million tons in 1938, and 3-1/4 million tons by 1945. The Dominion Government contributed generously to this expansion. It completed the fourth Welland Canal, which would enable ships with cargoes of 25,000 tons to pass between Lake Ontario and Lake Erie. It also expanded the capacity of the Beach Canal between the Lake and the Harbour to accommodate the largest of the Lake ships. The City Government also subsidized the port activities. Between 1902 and 1927, it gave the Commissioners $4,000 per annum, but increased this grant to $10,000 per annum in 1927 and $12,000 per annum in 1932. As

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38. These paragraphs are based on a number of sources: Milestones in the History of Hamilton Harbour, unattributed, Hamilton Harbour Commissioners, n.d.; Hamilton Harbour Scrapbooks, Hamilton Public Library, Volumes 1-10, various newspaper dates; P.J. Cowan, The Welland Ship Canal between Lake Ontario and Lake Erie, 1913-1932, Minister of Railways and Canals, 1935; Dept. of Railways and Canals, The Welland Ship Canals, Minister of Railways and Canals, 1935.

39. Tonnage statistics do not, of course, reflect the value of cargo flows in any accurate way. More details on the shipping and navigation within the Harbour will be the subject of a future Copps Chair Occasional Report.

a result, the Commissioners levied no user charges on ships until 1938.

The industrial location strategy was also successful and linked to increased cargo flows in the Harbour. The Commissioners built two more public warehouses in 1924 and 1927, and enjoyed a useful rental income of almost $15,000 in 1938 from land reclaimed and infilled for development. More important, the Commissioners sold water lots to private interests to undertake the development of private docks. Lots were sold to Canada Steamship Lines (23 acres), Stelco (28 acres), Canadian National Railways (3 acres), Otis Elevators (29 acres), and Hamilton By-Products (8 acres). Stelco would spend $8 million on its bulk materials dock; Canada Steamship Lines some $2 million on expansion at its terminal; and Hamilton By-Products some $1-1/2 million on its new dock. The terms of the sales were generous to these economic entrepreneurs. Lots averaged only $50 per acre, except for Stelco which paid $250 per acre. Once again, political institutions proved accessible and generous to the Hamilton's economic elites.

Post war developments in the Harbour extended the two pre-war strategies of the Harbour Commissioners. Shipping continued to increase, reaching a peak of 15 million tons in 1979, mainly in the form of iron ore and coal for the steel industry. As early as 1948, Hamilton exceeded Toronto as the major port on Lake Ontario, in terms of ship movements and tonnage imported and exported from the port.

The Dominion Government continued to aid harbour developments. It agreed to fund 50% of all harbour developments related to the establishment of the St. Lawrence Seaway. Some $5-1/2 million in developments occurred, as a result, in the three years following the opening of the Seaway in 1956. This was approximately the same value as

the capital developments in the harbour in the previous decade. The Dominion also further deepened the Ship Canal and reconstructed the bridge over the Canal. During the 1950's, some $60 million were spent on harbour improvements.

The Commissioners continued a vigorous "privatization" of water lots until the mid 1970's. The majority of water lots were sold to Stelco and Dofasco, culminating in a politically contentious "land swap" of 106 acres of lots fronting the steel companies for 313 acres on the eastern shores that the Commissioners wished to develop independently. Some 40 acres of water lots in the North-Western harbour that were alienated in 1959 were ultimately purchased by the City Government that, along with the Hamilton Conservation Authority, became increasingly opposed to the developmental strategies of the Commissioners.[40]

The wider economy of Hamilton and adjacent communities has changed, if not developed, in post-war years. Now some half of all manufacturing employment is in the steel and iron industries, and the once booming textile industry has dwindled to a mere 3% of total manufacturing employment. Hamilton itself has stabilized both its population growth and its level of employment, excepting the recession years of the early 1980's. Events outside the region including economic change and development, continue to determine the structure and size of the activities within Hamilton Harbour's watershed.

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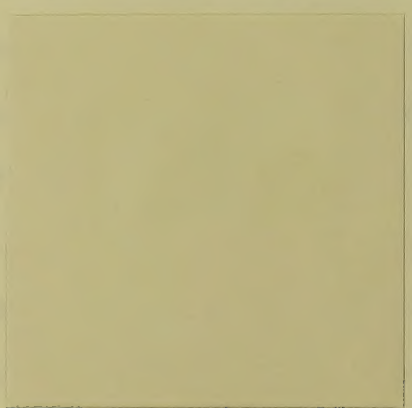
40. The conflict over the developmental strategies of the Commissioners were only exacerbated by the "kickback" dredging scheme established by the City appointee to the Commissioners. The appointee was convicted and jailed in 1975.



# PART IV

## Conclusion: The Resource and the Socio Economic Structure

### Parallel Artifacts

Hamilton Harbour is as much an artifact of human decision making as it is a product of physical, biological and natural change. As a purely natural resource, the Harbour and the watershed have been altered by construction, infilling, and wastes disposal, and by use as a source of food, water and energy. As a centre of population and enterprise, the watershed as well as the waters have provided economic opportunities, opportunities for settlement and immigration, and locations for industry, commerce and transportation. Neither the Harbour nor the watershed bear much resemblance to the lands sparsely occupied by refugee farmers of 200 years ago, nor indeed much resemblance to the small commerical town with the abundant trout and herring fisheries of 1867. Both the resource and the socio-economic structure have been fashioned and designed by human invention. In this sense, Hamilton Harbour is an artifact of human design.

Artifacts will only be designed if the designers can capture most, if not all, of the benefits of the design. Hamilton has provided ample opportunities for individuals and groups to capture such benefits. They have seized the opportunities of war to build munitions, clothe and feed troops, and supply agricultural machinery to western farmers that have fed beleaguered populations. They have used political institutions in Ottawa, Toronto and locally to attract railroads, protect and subsidize industries, privatize public water lots, and finance public improvements. The institutional arrangements of Canadian federalism and local government

have continued these incentives; they have been seized with alacrity by Hamilton's entrepreneurs.

Hamilton and its surrounding communities are thus "artifactual" communities designed by man and subject to error and exploitation by human design. The errors to date are manifest mostly in the biological communities of the Harbour itself. Plant, fish and other biological life in the Harbour have been severely reduced in numbers and in kind. Natural habitats have been replaced with land fill and concrete. Bottom sediments are covered with mud, silt and clay that contain alarming proportions of heavy metals and toxic chemicals. Larger resident fish species may have a 1 in 4 chance of contracting lip cancers.

Errors in design may extend to the social economic structure of the community. In designing and responding to wartime economies and protected markets for capital goods, the local economy has increasingly concentrated on the capital intensive manufacturing sectors of the economy. The opportunities and benefits have not always been weighed and balanced by the longer run costs and limitations of this practice. The future of a socio-economic structure based on heavy industry remains uncertain.

## Institutional Arrangements

Institutional arrangements comprise the laws, the regulations and the organizations of government that formulate and implement these laws and regulations. They prescribe what government may do and may not do, and what individuals and private persons and groups may and may not do. Occasionally, they specify what persons must rather than may do or not do.

What is apparent from the history of Hamilton and its region is how the institutional arrangements for the harbour have offered opportunities

to both public and private entrepreneurs to create and capture wealth. Some of this wealth came in the form of "economic rents" whereby institutions created regulations (such as tariffs) to direct wealth from other regions and from the consumers at large. Some wealth came in the form of infrastructure development from which entrepreneurs could capture primary and spin-off benefits. Further wealth came from taxpayers in the form of subsidies. Most of all, the "failure" of institutional arrangements at an international level to contain and limit warfare provided the most dramatic impetus for economic gain and development.

The institutional arrangements did, then, spur and develop the market economies of the region.[41] They did not, however, adequately protect and develop the non-market uses of the harbour, especially for water quality and for diverse and numerous aquatic ecologies. This failure of the institutional arrangements will be the subject of future investigations.

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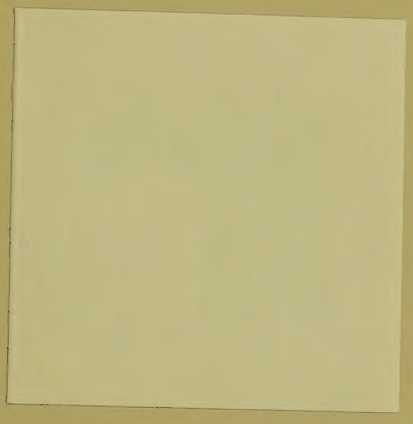
41. Hamilton did, of course, possess the locational advantages to which the flows of technological innovation could be directed and enhanced by institutional considerations. See John C. Weaver, "The Location of Manufacturing Enterprises: The Case of Hamilton's Attraction of Foundries, 1830 - 1890", in R.A. Jarrell and Arnold E. Ross, (eds) Critical Issues in the History of Canadian Science, Technology and Medicine, HSTC Publications, Ottawa, 1983, pp. 197-217.



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